EPA Critical Ecosystems Workshop

Seven Lessons Learned

From the Mid-Atlantic Integrated Assessment (MAIA) Experience

Tom DeMoss
Pat Bradley

A Salute To Some of The MAIA Leaders

- Tom DeMoss, Former MAIA Director
- Pat Bradley, Acting MAIA Director
- Henry Longest, Deputy Assistant Administrator, ORD
- Tom Pheiffer, Groundwater and Surface Water
- Rick Kutz, Land Use, Landscapes, and Coastal Bays
- John Paul and Kevin Summers, Estuaries
- Steve Paulsen and John Stoddard, Streams
- Bruce Jones, Landscapes
- Doug Norton, Landscapes
- Mike McDonald, EMAP Director
- Gil Veith and Rick Linthurst, EMAP Leadership
- Ron Landy, Forests

Presentation Contents

- Seven Lessons Learned From MAIA
- Success Stories using MAIA Findings
- Management Recommendations Based on MAIA

Environmental Goal for the Mid-Atlantic Region

- Safe and Sustainable Environment for Humans and Other Living Organisms

MAIA Lessons Learned

1 Living Organisms Are Stressed Throughout The Region

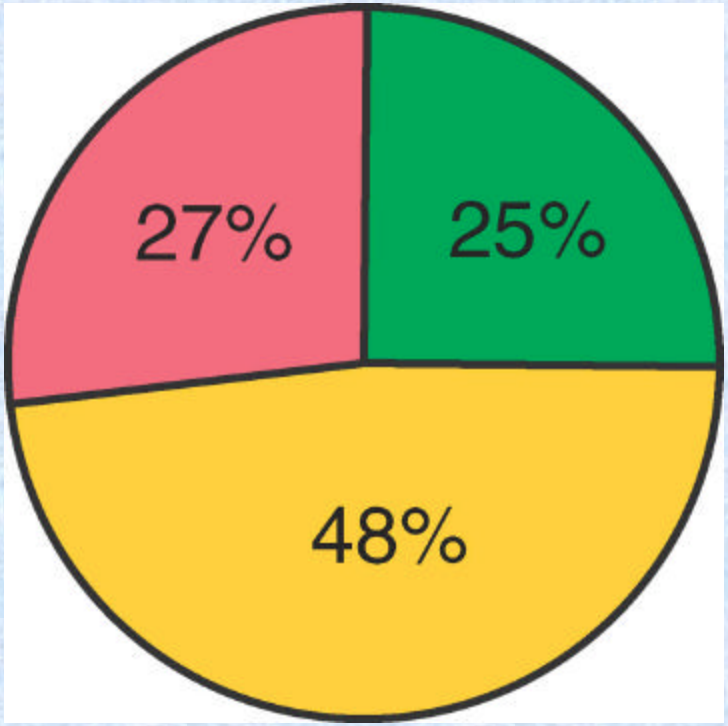
Birds

Trees

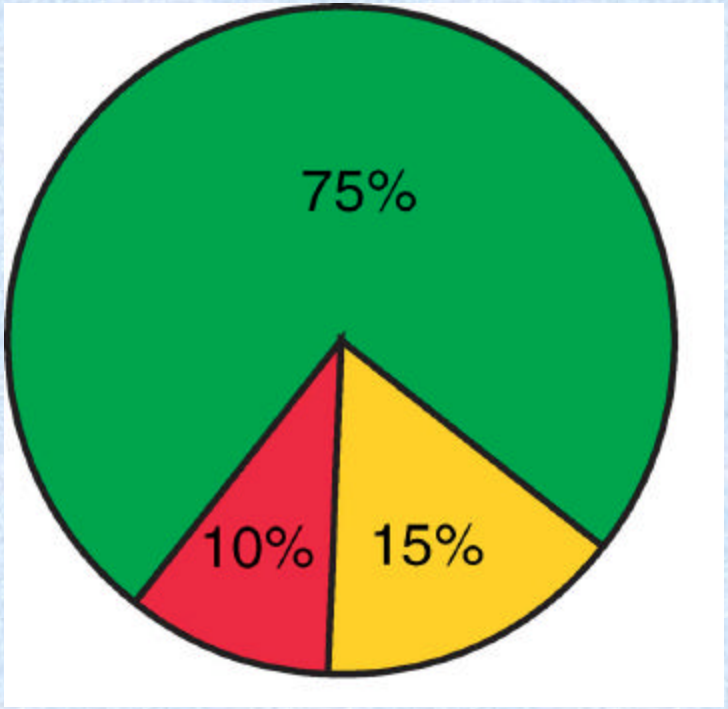
Benthic Macroinvertebrates

Fish

Benthic Macroinvertebrates

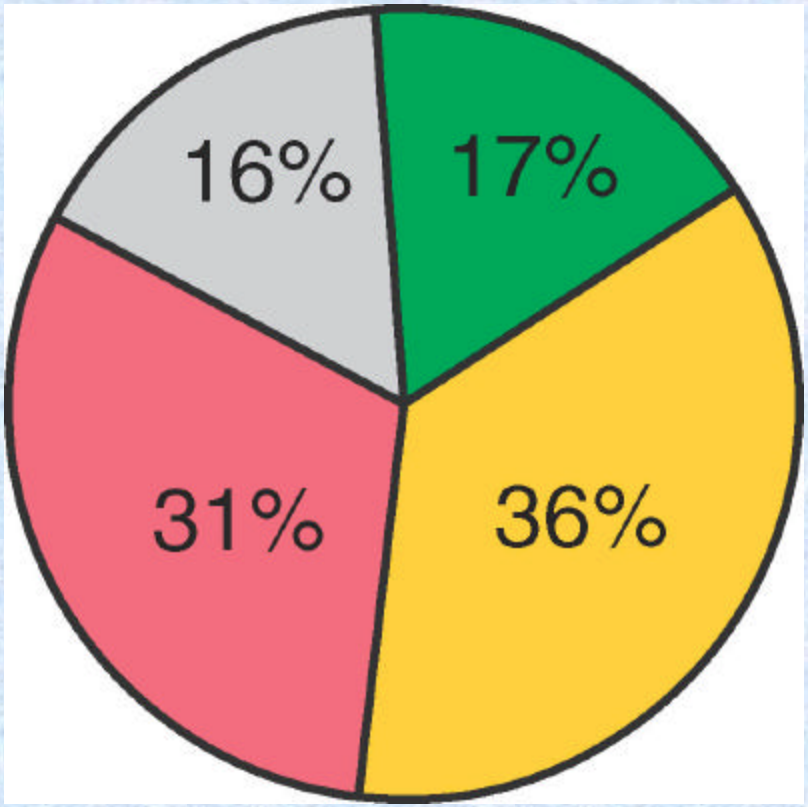


75% of stream benthic communities are impacted - Stream benthos are sensitive to pollution and other stream disturbances.



25% of the estuarine benthic communities are impacted - in most areas suffering from low dissolved oxygen.

Fish



- Using fish indicators, almost twice as many Highland stream miles were in poor condition (31%) as in good condition (17%).
- 36% of stream miles are in fair condition.
- 16% of streams were too small to catch fish.

MAIA Lessons Learned

2 Birds, Ecological Condition and Land Use/Land Cover Are All Clearly Linked

- Good and Excellent Bird Community Associated with >85% Forest in the Watershed
- Poor Bird Community Associated with < 30% Forest in the Watershed
- Poor Bird Community Also:
  - When Agriculture >60% of the Watershed, or
  - When Urban >30% of the Watershed

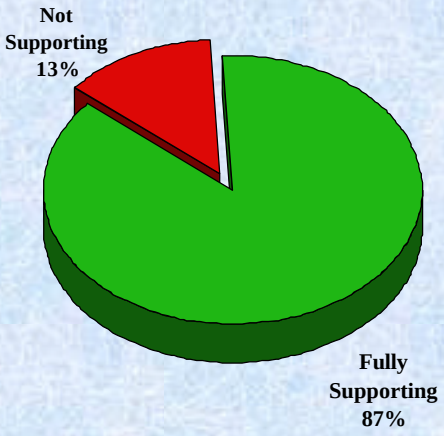
MAIA Lessons Learned

3 Biological Indicators Integrate Chemistry, Habitat, Pathogens and Other Stressors

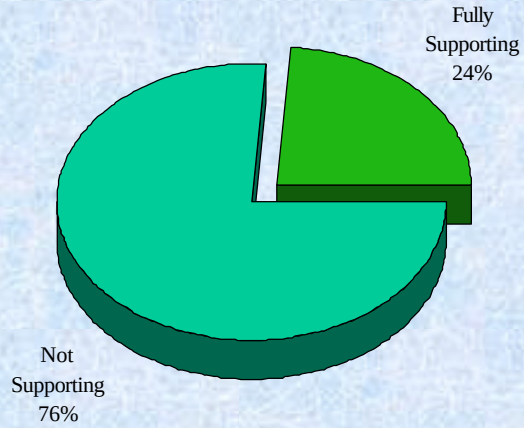
- Chemical Spills, Storm water Discharges of pollutants, or Other Short-Term Events can be missed if only chemical or physical indicators are measured
- Living organisms provide a more complete picture of the condition of the place in which they live

MAIA Lessons Learned

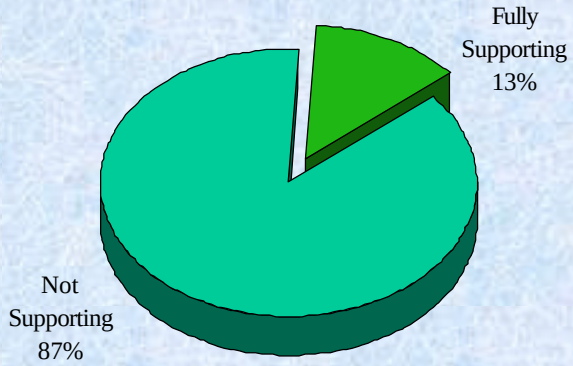
4 Chemistry Does Not Provide A Complete Picture of Environmental Condition



Traditional 305(b) Report
Chemical Evidence
Aggregation of Existing Data



New Report
Chemical Evidence
Probability Survey



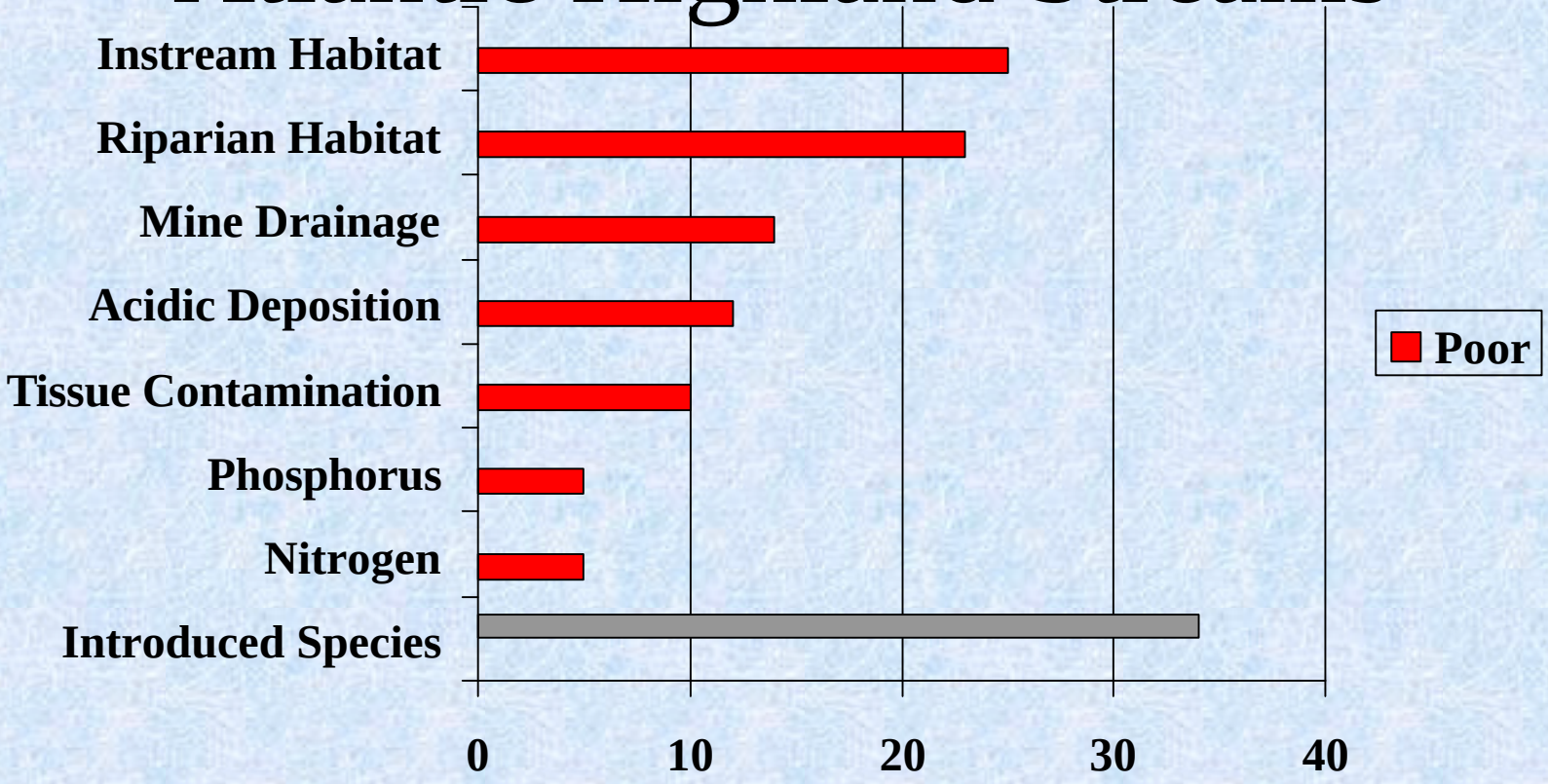
New Report
Biological Evidence
Probability Survey

MAIA Lessons Learned (continued)

5 Habitat Loss and Degradation is a Major Environmental Stressor in the Region

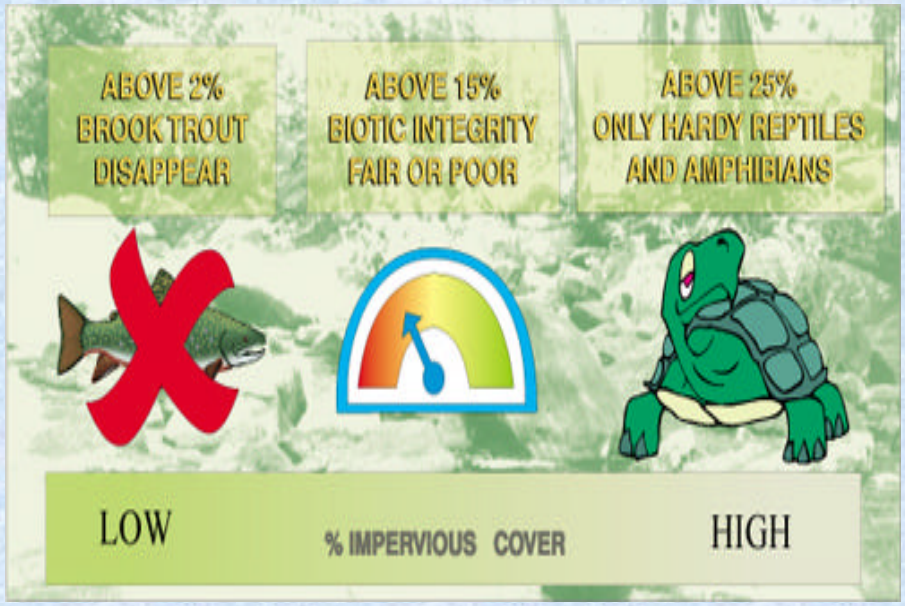
- East - Urban Sprawl
- West - Resource Extraction (Timber Harvest, Mining, etc.)
- Region-wide - Forest Fragmentation Leads to Habitat Degradation

Ranking of Stressors in Mid-Atlantic Highland Streams



Habitat Loss and Destruction impacts the greatest % of stream miles in the Highlands

Stream Stressors



The health of many streams is largely influenced by the amount of impervious land cover upstream.

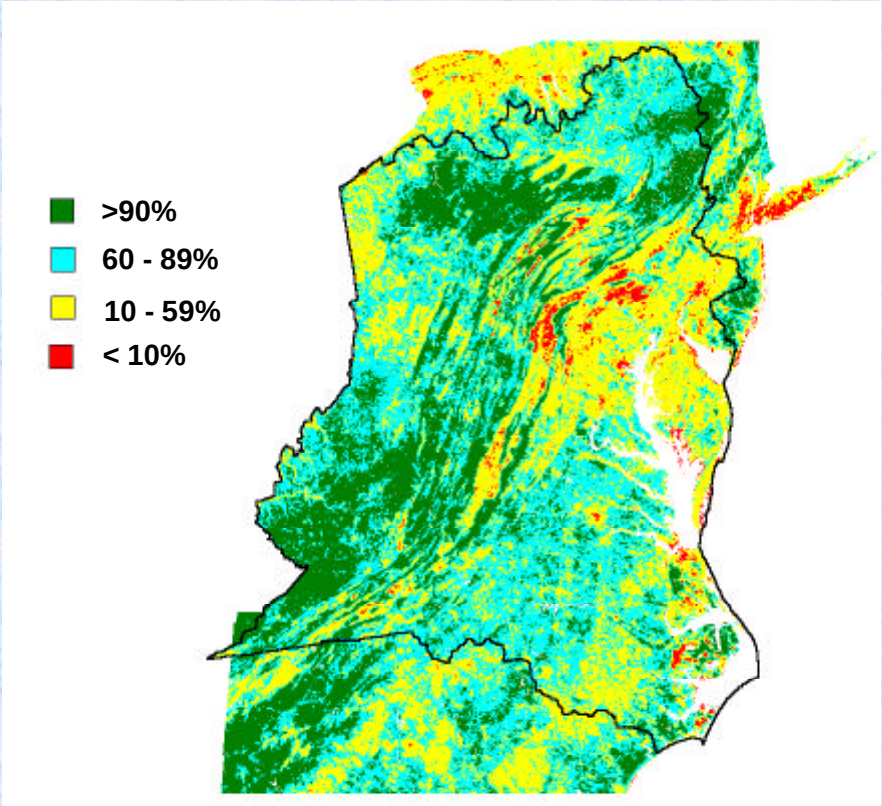
Removing trees, shrubs and other tall grasses from stream banks contributes to poor riparian habitat.

MAIA Lessons Learned (continued)

6 Forest Fragmentation is Wide-spread Throughout The Region

- About 20% Of The Watersheds In The Mid-Atlantic Have Forest Habitat That Is Suitable for Wide-Ranging Animals Like Bear
- About 33% of the Watersheds Have Forest Habitat That Is Suitable for Moderate-Ranging Animals Like Turkeys

Forest Fragmentation



> 90 % interior forest landscapes
> 10 percent highly fragmented
60 % separates well-connected from less well connected.

- Mid-Atlantic Forests Have Greatest Interior Temperate Deciduous Forest Area In The World
- Forest fragmentation is highest in watersheds around the Chesapeake Bay and in western Pennsylvania.

MAIA Lessons Learned (continued)

7 Non-indigenous Invasive Species are a Major Problem in the Mid-Atlantic

- Non-native Fish In 32% of Highland Stream Miles
- Gypsy Moths Defoliated Over 2 Million Acres of Trees in Last 5 Years
- Chestnut Blight Wiped Out Chestnut Trees
- Purple Loose-strife is crowding out other freshwater wetland species

Success Stories Using MAIA Findings

- EPA's State of the Environment Report
- West Virginia and Maryland now using probabilistic/biological monitoring
- Landscape capabilities used by Maryland West Virginia and Canaan Valley Institute
- Canaan Valley Institute-Report to Congress

Management Lessons Learned
-Good News!!-

- Partnerships work!!
  - -ORD/Regional Office
  - -Other federal/state agencies
  - -External Customers
- “Eco-talk” is going mainstream!!
  - -Biology as an indicator
  - -Habitat loss
  - -Forest Fragmentation
  - -Impervious Areas
  - -Invasive Species

Some Specific Management Recommendations

- Build more ecological endpoints into EPA strategic planning
- Train/Use Regional Senior Managers as ambassadors for cutting-edge science
- ORD/Regional offices should provide annual training to end users (e.g., Locals) on latest science
- Work on “plain English” communications to end users
- Continue pushing partnerships/integration